ON THE

FAILURE OF SALICYL-COMPOUNDS

IN THE

TREATMENT OF ACUTE RHEUMATISM

ACCOMPANIED WITH

INFLAMMATION OF THE GENITO-URINARY MUCOUS MEMBRANES:

A Paper read before the Medico-Chirurgical Society on the 6th of July 1881; with some Additional Observations on the Characters and Nature of the Disease.

BY

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TREATMENT OF ACUTE RHEUMATISM, Etc.

From a distant period the bark of the willow (*Salix alba*) had been used in the treatment of fever; but even the discovery by Leroux, in 1828, of its active principle, salicin,[1] did not lead to any marked extension of its applications. By the publication, in 1874, of Kolbe and Lauteman's[2] discovery of the synthesis of salicylic acid, however, a remarkable impetus was given to the applications in disease of the salicyl-compounds. Kolbe and Meyer[3] soon afterwards drew attention to the antiseptic properties of salicylic acid. Its antipyretic action was examined by Wagner,[4] Fürbringer,[5] and Büss;[6] while Stricker,[7] Broadbent,[8] Riess,[9] Leonardi-Aster,[10] G. Sée,[11] Balz, Petit,[12] and many others demonstrated its therapeutical value in rheumatic fever. In the meantime, the value of salicin in this disease was also announced by Maclagan[13] and Petit,[14] and now the salicyl-compounds have established for themselves a position of supreme efficacy in the treatment of rheumatic fever. Their employment produces results of the most gratifying description to both physician and patient; enabling the former to shorten the course of a disease whose protracted duration is attended with many risks, and affording to the latter, generally within a few hours, complete relief from almost unbearable suffering. Abundant evidence in support of these statements has now been obtained. In

[1] *Journal de Chimie Médicale*, vi. 1830, p. 341.
[2] *Annalen der Chemie und Pharmaeie*, cxiii. p. 125, and cxv. p. 201.
[3] *Journal für Praktische Chemie*, xii., 1875, p. 133.
[4] *Journal für Praktisehe Chemie*, xi., 1875, p. 57.
[5] *Centralblatt für die Medieinisehen Wissenschaften*, 1875, p. 272.
[6] *Deutsehes Arehiv für Klinische Medicin*, 1875, xv. Heft v. pp. 457–501.
[7] *Berliner Klinische Wochensehrift*, 1876, Nos. 1 and 2, pp. 15 and 99.
[8] *Lancet*, April 8, 1876, p. 530.
[9] *Berliner Klinisehe Wochensehrift*, 1875, Nos. 50 and 51, pp. 673 and 690.
[10] *Deutsehe Zeitsehrift für Praktisehe Medizin*, 1876, No. 23.
[11] *Bulletin de l'Académie de Médeeine*, tome vi., 1877, p. 689.
[12] *Bulletin de Thérapeutique*, xci., 1876, pp. 454 and 508.
[13] *Lancet*, 4th and 11th March 1876.
[14] *Loc. eit.*

the following table[1] it is presented in a clear and graphic form :—

Method of Treatment.	No. of Cases.	Average duration of Pain.	Average duration of Illness while in Hospital.
Alkalies, lime juice, etc.,	316	17·2 days.	22·6 days.
Salicylate of sodium,	305	2·92 days.	9·58 days.

The value of the salicyl-compounds is manifested in patients of every age,[2] and not only in the common form of rheumatic fever or acute rheumatic polyarthritis, but also in the variety of that disease which accompanies scarlet fever,[3] in rheumatic iritis and sclerotitis,[4] in acute muscular rheumatism,[5] in acute gout,[6] and in chorea manifestly associated with rheumatism.[7]

On the other hand, experience has shown that they fail to produce benefit in certain forms of disease, and especially of rheumatic disease, where good results might have been anticipated from their employment. This failure has been observed in chronic rheumatism and in rheumatic gout; but even in acute polyarthritis, apparently of rheumatic character, the coexistence of disease of the genito-urinary mucous membrane in a remarkable manner prevents the therapeutic benefits of the salicyl-compounds from being produced. I propose to direct the attention of the Society to several cases illustrative of this failure, which have recently come under my observation.

Case I.—The first case is that of a man, John O., æt. 31, a baker by occupation, who was admitted into Ward XXIII. of the Royal Infirmary on the 5th of February 1881, suffering from pain in the joints and from gonorrhœa.

History of Attack.—The gonorrhœa had been contracted five weeks previously. On its first appearance, slight twinges of pain were felt in various parts of the body. The discharge was profuse for two weeks, when it began to diminish; and soon afterwards, and subsequently to the patient having been exposed to cold and wet, the pains became severe, and they localized themselves in the joints in the following order: First, the right hip, then the forefinger of the left hand, then the right ankle, then the right knee, and soon afterwards and almost simultaneously the two shoulders,

[1] "The Physiological and Therapeutical Effects of Salicylic Acid and its Compounds." By William Oliver Moore, M.D., etc. *New York Medical Journal*, August 1879, p. 115.

[2] G. Sée, *loc. cit.*, p. 726; J. Deseille, *De la Médication salicylée dans le rheumatism chez ces enfants. Thèse de Paris*, 1879, p. 79.

[3] A. Vulpian, "Du mode d'action du Salicylate de soude dans le traitment du rheumatisme aigu," *Journal de Chemie et du Pharmacie*, 5me série, tome ii., 1880, p. 435; J. Deseille, *loc. cit.*, p. 79.

[4] Galezowski, *Bulletin de l'Académie de Médecine*, tome vii., 1878, p. 86.

[5] Vulpian, *loc. cit.*, p. 439; J. Deseille, *loc. cit.*, p. 22.

[6] G. Sée, *loc. cit.*, p. 744; P. A. Blanchier, *Recherches Expérimentales sur l'Action Physiologique du Salicylate de Soude*, 1879, p. 142.

[7] Thomas R. Fraser, *British Medical Journal*, 9th December 1882, p. 1132.

the right sterno-clavicular articulation, and the right side of the neck.

Previous Health.—The most significant fact in his previous history was that on three previous occasions he had suffered from gonorrhœa. The first attack occurred about twelve years ago, and was followed by rheumatic pains in the feet; the second, about eight years ago, was complicated with bubo, and followed by rheumatic pains in the right ankle and left wrist; and the third, about four and a half years ago, and was followed by pains in the left ankle. On each occasion, the rheumatic pains appeared about three weeks after the gonorrhœa was contracted, and lasted for several months. On the third occasion, the rheumatic pains are said to have persisted for several months after the discharge had entirely disappeared. The patient had otherwise enjoyed good health. His circumstances were comfortable, and he indulged in alcoholic stimulants to an extent which he regards as moderate, only now and again getting drunk on Saturday nights. There is no history of rheumatism in his near relatives.

Condition, 7th February (twenty days after admission). — Patient is a well-developed man, 5 feet 9 inches in height, and weighing about 10 stone 10 lbs. He is confined to bed, and is equally uneasy in every position, but refrains from movement on account of the pain which is thereby caused. The face is flushed, and moist with perspiration. The skin is hot (100°·4) and everywhere covered with profuse perspiration, which has an acrid odour and acid reaction. The glands in the inguinal region are found to be enlarged.

Locomotory System.—The limbs are well developed and museular. The right sterno-clavicular articulation is red, slightly swollen, and painful to touch. On the right side, there is pain extending from the occiput downwards along the neck to the spine of the scapula and to the acromion process, in the line of the trapezius muscle. On the left side, the face is painful, and there is pain on pressure about the middle of the spine of the scapula. The shoulders, elbows, and wrists of both sides are apparently unaffected, but the metacarpo-phalangeal joint of the left finger is red, swollen, and tense, and painful when moved or touched. On the right side, there is pain from the lower part of the ischium to the tuber ischii, and this region is tender and slightly swollen. The right knee is greatly swollen, but not red; the swelling is chiefly in the upper synovial sac, above the patella, and the effused fluid can be squeezed into the lower sac. The knee is kept in a semi-flexed position by the patient, and it is extremely painful when moved or touched. The right ankle is also affected; it is only slightly swollen, and is not red. Pain is produced on firm pressure over the malleoli, but there is very little pain on movement.

Genito-Urinary System.—Patient says he micturates frequently. He now has no pain or difficulty in micturition. There is a little

moisture at the orifice of the urethra, which does not amount to a discharge. No cicatrices can be observed on the glans. Urine, 60 oz., sp. gr. 1025. It is high-coloured, somewhat opaque, and of a slightly acid reaction. There is no albumen, sugar, bile, nor blood. On standing, a deposit forms, which is composed chiefly of triple phosphates, mucus, bacteria, and epithelial *débris*.

Circulatory System.—Patient suffers from dyspnœa, particularly when any exertion is made; but there is no palpitation nor pain at the precordium. The pulse has varied from 78 to 90. It is small, regular, and easily compressible. The arteries are neither rigid nor tortuous. The position of the apex beat and the area of cardiac dulness are normal. In the tricuspid and mitral areas an impurity is detected with the first sound.

Respiratory System.—Evidence of slight and restricted bronchitis exists, but otherwise the condition of the respiratory system is normal.

Nervous System.—With the exception of the severe pain in the situations that have been described, no symptom is present in connexion with the peripheral nervous system. The senses of hearing and taste are somewhat defective. Intelligence is good; the patient sleeps very little, and now and then experiences some giddiness.

Diagnosis.—The elevated temperature, the profuse acrid and sour perspiration, the painful, red and swollen condition of many of the joints, and the relationship of the illness to a gonorrhœal discharge, indicated with tolerable clearness that the patient was suffering from gonorrhœal rheumatism or acute rheumatic polyarthritis, accompanied with gonorrhœal urethritis. It was anticipated that the illness would be a protracted one.

Progress and Treatment.—I determined to treat the patient, in the first instance, with salicylate of soda, and in such a manner as to derive clear evidence of its worth in the disease. From the 6th of February to the 3rd of March (twenty-six days), 20-grain doses of salicylate of soda were ordered to be administered every two hours, day and night; but on several occasions the salicylate was not given because the patient happened to be asleep. On the 8th, 9th, 10th, and 11th of February, sulphate of quinia, in a dose of 5 grains, was substituted twice or thrice during the night for salicylate of soda; and on the 21st of February, five of the doses of salicylate of soda were not given, with a result to which reference will afterwards be made. During this time, the temperature was taken every two hours, and the general result was that only a slight reduction took place during the first two days of administration, which, however, was not maintained throughout the rest of the administration. The temperature curve between the 7th of February and 3rd of March varied generally from 99° to 101°, and on many occasions attained an elevation of 102°. On the 21st of February, the administration of salicylate was stopped during ten hours, implying the intermission of five doses; and the result was that the previous

temperature of 100°·6 rose in the first two hours to 102°·6, in the second to 104°, and in the third to 104°·6; while it continued at 104°·6 and at 104° in the subsequent fourth and fifth intervals of two hours. The salicylate was again given every two hours, in doses of 20 grains, and in two hours the temperature had fallen to 102°·8, and in four hours to 101°·2. The highest temperature that was observed in the course of the illness occurred during this temporary intermission in the administration of salicylate of soda. The prolonged and frequent administration of what must be regarded as full doses of the remedy did not appear to produce any important inconvenience. Indeed, the only inconveniences observed were partial deafness with tinnitus, and some weakness in the pulse, which last cannot alone be accounted for by the action of the salicylate; and these inconveniences did not appear until the 21st of February.

It is noted in the very careful record of the case made by my resident physician, Dr Logan, and by the clinical clerk, Mr J. W. Johnston, that six days after the treatment was commenced the rheumatic pains still continue, although they are slightly less severe at the neck, lower part of the sacrum, and left sterno-clavicular articulation. On the other hand, the left knee had become red and painful, and the metacarpo-phalangeal and phalangeal joints of the left thumb had become red, painful, and swollen. Again, on the 21st of February, the patient complained of a constant pain on the right side of the head, with frequent paroxysms, in which the pain extended to the right ear and parietal region. In the other situations, the painful and other conditions remained unimproved until about the 18th of March, when a very slow but general improvement took place.

Previously to stopping the administration of salicylate of soda, on the 24th of February, 10℥ doses of tincture of digitalis were given thrice daily, and they were continued, after the salicylate treatment had been discontinued, until the 11th of March. From the 12th until the 16th of March, the patient received 10 gr. doses of carbonate of lithia thrice daily; blisters were on several occasions applied to the precordium and to the right knee; and the subsequent general treatment consisted in the administration of colchicum, cod liver oil, and, finally, of citrate of iron and quinia. Aperients were frequently required on account of persistent constipation.

In reference to the treatment of the urethral discharge, a catheter was occasionally passed, and from the 16th to the 24th of February balsam of copaiva was administered, with the result that the discharge became very slight in a few days, and had apparently almost ceased on the 20th of February. This fact is of significance in relation to the continuance of the pyrexia, and to the continuance and fresh manifestations of the arthritic disturbances subsequently to the 20th of February. One of the best marked of these exacerbations took place on the 2nd of April. It was associated with pain

in both acromio-clavicular articulations and in the right knee, and with a rise of temperature to 102°·2 ; but it quickly subsided after a few doses of salicylate of soda had been administered.

That the urethral inflammation had not, however, at this time altogether disappeared was shown by the circumstance that a very slight amount of moisture again appeared at the urethral orifice on the 10th of April, but it ceased after three or four injections of weak solution of tannin, and did not again make its appearance.

Pain and stiffness lingered most persistently in the right knee. An interrupted induction current was on several occasions applied to the knee in the months of March and April, and appeared of great service in relieving the painful condition.

The patient had so far recovered by the 2nd of May that he was then able to sit up for a few hours. An examination of the blood at this date showed that it contained 81 per cent. of hæmoglobin and 4,870,000 of red corpuscles per cub. mill.; and the absence of anæmia was again established by an examination of the blood made on the 11th of May, when it was found to contain 84 per cent. of hæmoglobin and 5,000,000 red corpuscles per cub. mill. He was dismissed from the hospital on the 6th of June, entirely free from all symptoms of his illness, with the exception of a little stiffness in the right knee, and of marked atrophy of the muscles of the right thigh and leg.

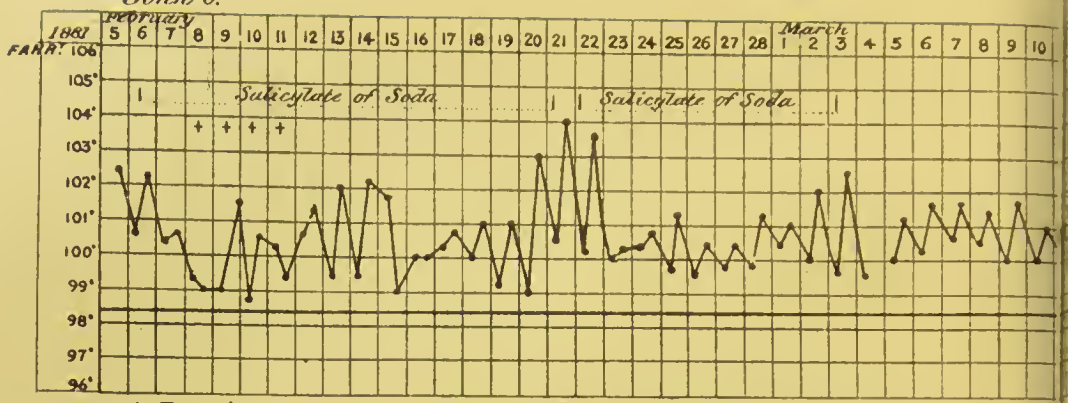
The temperature at about 9 o'clock in the morning and evening, from the 5th of February to the 19th of April, has been represented in the subjoined chart. (Chart 1.)

Case II.—The second case which I propose to bring under the notice of the Society is that of a man, Thomas T., æt. 25, unmarried, and following the occupation of a groom. He was admitted into Ward VI. of the old Royal Infirmary, on the 27th of May 1879, suffering from fever, and from pain at the right elbow, wrist, and ankle, and occasionally in the left leg.

History.—Three weeks previously the patient "caught cold," and a few hours afterwards he felt feverish, and the right knee became painful. Two days afterwards, while he was engaged in carrying a heavy saddle, the pain of the right knee, as he said, removed to the right arm, localizing itself first at the elbow, but afterwards extending to the wrist and fingers. Three days afterwards it reappeared in the right knee in a more severe form than before, and soon involved the ankle and foot. The pain in the right arm and leg was so severe that he was obliged to go to bed, and he remained there until his removal to the hospital.

Previous Health.—When seven years of age patient had an attack of scarlet fever, followed in a few months by one of typhus fever. When ten years of age he had an attack of rheumatic fever, which he attributes to exposure to cold and damp, and which lasted for six weeks. He afterwards enjoyed pretty good health until three

John O.

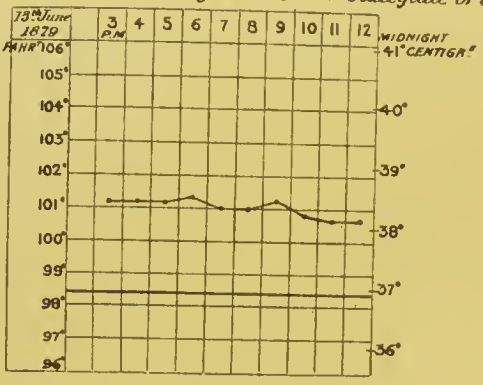


+ Days in which two or three 5 grain doses of Sulphate of Quinia were given in place of the ordinary dose of Salicylate of Soda

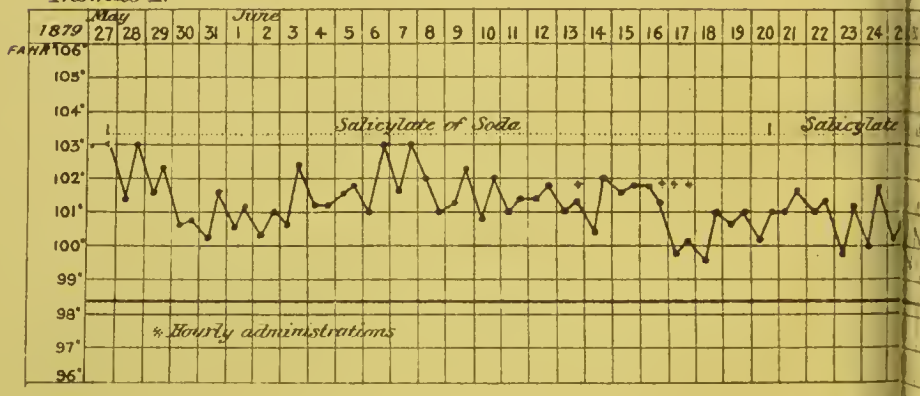
Chart 2.

During the hourly administration of 20 grain doses of Salicylate of Soda

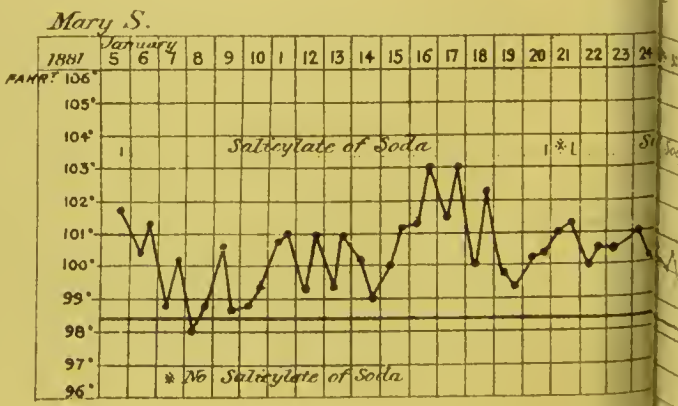
Thomas T.



Thomas T.



Mary S.



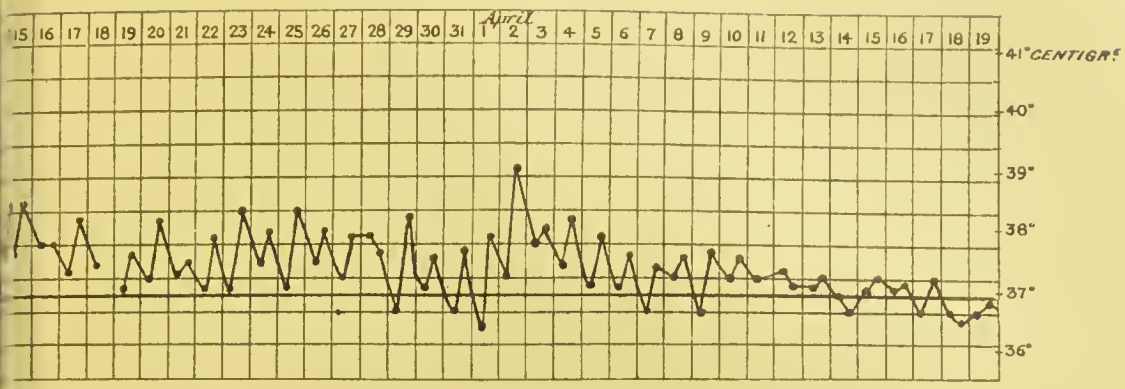
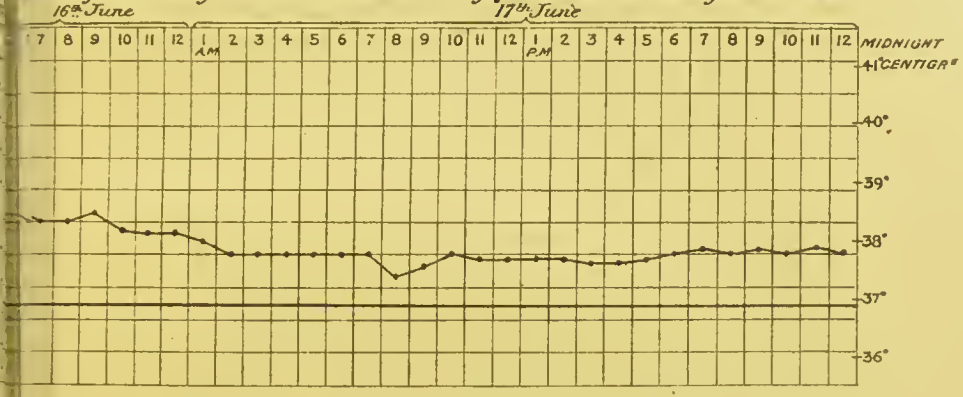
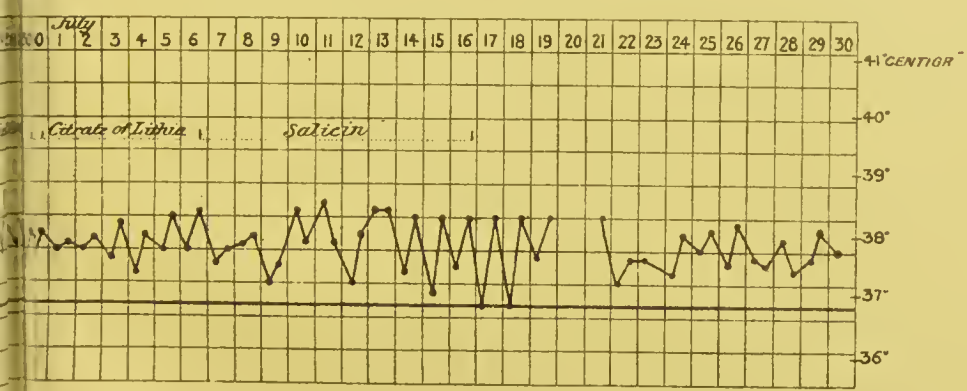
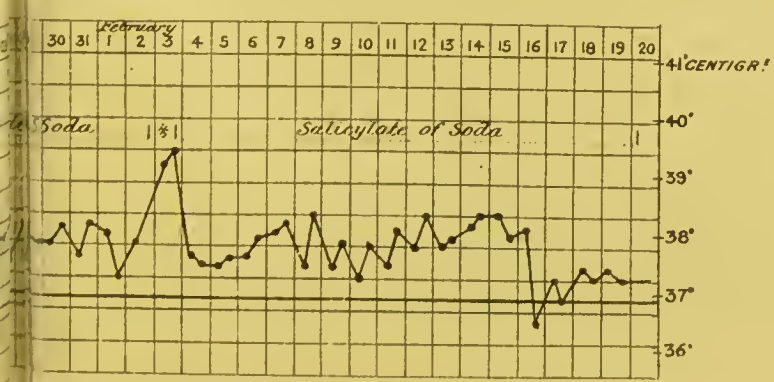


Chart 3.

during the hourly administration of 20 grain doses of Salicylate of Soda







J. Bartholomew, Edin.

years ago, when he had a second attack of rheumatic fever, also attributed to exposure, from which he did not recover until three months. This second attack was immediately followed by a third, owing, he states, to his again being exposed to cold and damp; and for several months after this third attack he suffered from pain and stiffness in the ankles, from which, however, he had completely recovered at least twelve months previously to the fourth attack, for which he was admitted into the Infirmary.

Social Condition and Habits.—Patient states that he is temperate in respect to both alcoholic and venereal indulgence.

As far as he is aware there is no history of rheumatism in his family.

Present Condition (28th May).—Patient is a well-developed man, 5 feet 11 inches in height, with well formed though rather flabby muscles, and with a cheerful and intelligent aspect.

The skin is hot (103° last night, 100°·4 this morning), and bathed in perspiration, which has an acrid odour.

The elbow, wrist, fingers, knee, and ankle of the right side are red, swollen, and painful; and the left knee and both temporo-maxillary joints are painful.

Circulatory System.—The pulse is regular and rather weak, and at the rate of 92 in the minute. He has no palpitation nor precordial pain; and the heart sounds are normal, with the exception of reduplication of the second sound in the pulmonary region.

Respiratory System.—Patient has a short dry cough, but there is no other symptom in connexion with the respiratory system.

Urine.—He states that he passes his urine without difficulty or pain. The urine is of the usual quantity and specific gravity, and free from sugar. It deposited a small quantity of phosphates, and the supernated fluid became turbid on heating, and did not become quite clear on the addition of nitric acid.

Diagnosis.—The opinion was formed that the case was one of simple acute rheumatic polyarthritis, complicated with albuminuria.

Treatment.—The patient was at once treated with salicylate of soda, in doses of 20 grs. four times daily, and the affected joints were wrapped in cotton wadding. This treatment was continued from the 27th of May to 12th of June, and it entirely failed in reducing the pyrexia, and was for many days ineffectual in relieving the local symptoms. In the second week of June, however, the pain began to diminish in the right ankle and knee, as well as in the wrist and fingers of that side, no improvement being appreciable in the right elbow. The treatment failed, also, in preventing the involvement of other joints; for, on the 3rd of June, both shoulders became for the first time painful, and soon afterwards the elbow, wrist, knee, and ankle of the left side.

On the 13th of June salicylate of soda was given every hour, in 20 gr. doses, from 2 to 10 P.M. (180 grs. in eight hours), with the

result that only a very slight reduction of temperature was produced. This heroic administration caused sickness, vomiting, headache, deafness, dimness of vision, and so great general distress that it could not be continued; and on the two following days, a return was made to the administration of 20 grains four times daily. The temperature having again risen, the hourly administration of salicylate of soda was repeated on the 16th and 17th; but it could not longer be continued on account of the recurrence of severe symptoms of salicylism, accompanied as before with profuse sweating and great feebleness. The state of the temperature during the hourly administrations is shown in Charts 2 and 3. From the 18th to the 19th of June, the frequency of administration was again reduced to four times daily. On the 20th of June, salicylate of quinine was given, in the dose of 5 grains four times daily, and was continued in this daily quantity until the 25th of June, when the same dose was given six times daily, and continued with this frequency until the 30th of June. It, however, also failed to reduce the pyrexia, while the extreme prostration and cinchonism that were produced led to its being abandoned.

For several days the patient was then treated with citrate of lithia. It also failed in effecting any decided improvement. Salicin was then administered in 15 grain doses, six times daily, from the 6th to the 15th of July, when the appearance, in a very aggravated form, of the toxic symptoms of this remedy led to its administration being stopped. During all this period the temperature, as the accompanying chart (No. 4) shows, ranged from 100° to 103°, with the exception of an occasional fall to 99° or 99°·4. Many of the joints first affected had latterly become less painful and swelled, but I was unable to attribute the tardy amelioration to the treatment which had been pursued; while the opinion that the disease was merely running a natural course received confirmation from the disappointing circumstance that it had involved certain new localities at the very time when the patient was suffering from the inconvenient effects of large doses of several of the remedies.

The aspect of affairs, however, now underwent a gratifying change, when it was discovered that the patient was suffering from a urethral discharge, which we ascertained to be the result of a gonorrhœa he had contracted some weeks before the present illness, and the existence of which he had concealed from us. The significance of this complication was at this time entirely unknown to me; but soon after commencing its treatment by copaiva, the influence it had exerted in preventing the usually remarkable therapeutical effects of the different remedies which had been so liberally administered became apparent. When the gonorrhœal discharge was cured the arthritic symptoms steadily lessened, pain and swelling gradually disappeared, and the fever entirely, though slowly, subsided. The patient was soon afterwards dismissed from the hospital.

Case III.—The patient in this third case was a woman, Mary S., æt. 25, a cook, and unmarried, who was admitted into Ward XXV. of the Royal Infirmary, on the 5th of January 1881. On her admission, she was suffering from pain in the back between the shoulders, in both legs and knees, and in the elbow, wrist, and hand of the left side, and from chilliness alternating with heat and perspiration. On the evening of admission the temperature was 101°·8, and on the following morning 100°·4.

History of Present Illness.—On the 4th of January patient had been occupied washing clothes, and then, but more decidedly soon afterwards, she felt an uneasiness in her left wrist, which led her to suppose that she had sprained the joint, and about the same time pain was felt between the shoulders. As the pain in those situations became worse, and as she felt generally unwell, she went to bed that afternoon. On the following morning both knees were also painful as well as the front of the legs, the wrist being most severely so, and later in the day she had several rigors, there being much perspiration during the hot stages.

Previous Illnesses, etc.—Patient has had whooping-cough, measles, and quinsy when a child, and the last disease several times recently. About three years ago she suffered from acute "housemaid's knee," for which she was treated by Dr Joseph Bell. She has never had chorea nor rheumatism. She has always been in comfortable circumstances, but the rooms in which she worked in her last situation were cold and draughty. She has always been strictly temperate. Her father, mother, and only sister have never suffered from rheumatism. She is well developed, of good muscularity, with dark brown hair, and, though confined to bed, can lie in any position.

Condition Fourteen Days after Admission (*19th January*).—The skin is moist. The left wrist is red, slightly swollen, painful, and tender. Both knees, the left ankle, and the back are painful, and there is an uneasy feeling in all the other joints of the extremities.

Circulatory System.—The pulse is regular, not easily compressible, and 84 in the minute. The heart sounds in the mitral, tricuspid, and pulmonary areas are normal; but in the aortic area the first sound is slightly impure, and both sounds are here indistinct.

Respiratory and Digestive Systems.—The respiratory, digestive, and nervous systems are in a healthy condition, excepting that a few sibilant râles with crepitations are heard in the chest, and that the appetite is poor and the bowels constipated.

Urinary System.—Micturition is unattended with pain or any inconvenience. The urine has usually been of small amount and of somewhat high specific gravity, and it deposits some mucus and amorphous urates.

Diagnosis.—From the above history and symptoms, the diagnosis of simple acute rheumatic polyarthritis was arrived at.

Treatment and Progress.—In accordance with what is now with me almost a routine practice in severe cases of this disease, I ordered 20 grain doses of salicylate of soda to be given every two hours. This treatment was commenced on the evening of the day on which the patient was admitted (5th January), and it was continued until the 7th of January, when, as some improvement in the condition of the patient had occurred, the same dose was given every four hours. A return of severe pain in several of the joints, and a rise of temperature led, however, to a recurrence to the former bi-hourly administration on the 17th of January. It was continued thus until the 20th of January, when, although the pain again subsided and the temperature fell, weakness of the pulse and distressing deafness and tinnitus induced me to stop the administration for a few hours. While the salicylate was being thus freely given, the general course of the disease, in place of undergoing the amelioration that was looked for, became more general and developed more urgent symptoms. The left wrist became more swollen and red. In the mitral area a murmur appeared with the first sound of the heart, and the slight pyrexia manifested on the admission of the patient increased, until, on the 17th of January, the temperature ranged from 101° to 104°. Tincture of digitalis in 10 min. doses twice daily was now given for a few days.

On the 21st of January the administration of salicylate of soda was resumed, but 20 grain doses were now given only thrice daily, and continued until the 2nd of February. At this date the condition of most of the affected joints had considerably improved. The left wrist, however, had become worse; it was red, greatly swelled, and extremely painful, and the pain extended up the forearm to the elbow. The morning temperature on the 2nd of February, when the administration of salicylate of soda was stopped, was 100°·2; on the morning of the following day it was 102°·6.

The remarkable obstinacy of the disease to the therapeutic action of a remedy which so generally produces striking benefit, and my previous experience in other cases of failure, now raised a suspicion that the patient was suffering from gonorrhœa. On inquiry it was found that evidence of a slight discharge had been observed by the nurse, and on vaginal examination a white discharge of moderate quantity was detected, and it was observed that the hymen was absent. The leucorrhœa was treated by injections of permanganate of potassium and of solutions of astringent salts, and it soon lessened in amount. The treatment with salicylate of soda was resumed in doses of 20 grains thrice daily. The temperature fell considerably, and for some time the patient enjoyed nearly complete respite from pain in the left wrist. On the 9th February, however, the right wrist and elbow became painful, and in a day or two the pain returned in the left wrist. Leeches were applied to the left wrist, and some days afterwards tincture of colchicum, and then carbonate of lithia was substituted

for salicylate of soda. The temperature by-and-by fell to nearly the normal, and the pains disappeared from all the joints except the left wrist, where, in spite of blistering and fomentations, the swelling increased, until, on the 2nd of March, fluctuation could be detected, and on the 8th an opening spontaneously occurred and pus was discharged. Antiseptic treatment was adopted, and the wound slowly healed. Soon after this occurrence the condition of the patient rapidly improved. The temperature became normal, the pains entirely disappeared, and on the 30th of March the patient was able to leave her bed for a short time. The convalescence, however, was very tardy. Even as late as the 12th of April pain with slight swelling occurred in the two ankles, and it was not until the 12th of May that the patient was able to leave the hospital.

This case is one of considerable interest on account, in the first place, of the asserted rarity in women of acute rheumatic arthritis with the modification in its characters that are produced by inflammation of the genito-urinary mucous membrane; and in the second place, on account of the doubt which it throws upon the generally accepted opinion that this modification is necessarily associated with an inflammation of venereal origin. After the discovery of the vaginal discharge, the most careful inquiry was made into the history of its origin. The patient was apparently a respectable and trustworthy woman, and she consistently denied the possibility of venereal disease having been contracted by her. It was ascertained that she had suffered from a white discharge since the age of eighteen, which is increased by work, and becomes lessened in amount immediately after menstruation, but gradually increases again until the next menstrual period. At my request, Professor Simpson and Drs Hart and Barbour, on separate occasions, made careful vaginal examinations, and failed to discover the slightest evidence of urethritis or of gonorrhœal disease, the conditions being merely those of ordinary leucorrhœa. Although the discharge varied in its amount, it never altogether disappeared while she was under treatment. A month after she had left the hospital, a vaginal examination was again made, and slight leucorrhœa was found to be still present. The chart, No. 5, represents the temperature in this case during the time in which salicylate of soda was administered.

The postponement that has occurred in the publication of this communication allows me to add a description of other three cases that have come under my observation since the above three were brought before the Society. In the cases about to be described, the pyrexia, in its degree and duration, was less severe than in the former cases. One is the case of a female, and to it I would first refer.

Case IV.—The patient, Jane H., 28 years of age, a dressmaker, was admitted into Ward XXV. of the Royal Infirmary on the 11th

of July 1881, suffering from great pain with swelling in nearly all the joints. She had been exposed to cold on the night of the 2nd of July during a journey by boat from London to Edinburgh. Four days afterwards, she suffered from sore throat and general malaise. The joints, especially the shoulders, then began to ache, and she was obliged to remain in bed; but as no improvement occurred, she obtained admission into the Royal Infirmary.

When 14 years of age, the patient had been ill for six months with a severe attack of rheumatism, from the effects of which she suffered for many years, principally in the form of frequent faintings. Since the age of 22, she has enjoyed good health, and she has been in comfortable circumstances all her life. There is no history of rheumatism in her near relations.

State on 12th July.—She is fairly well developed. She lies in a recumbent posture, maintaining perfect steadiness, as any movement causes great pain. As is so often observed in rheumatic fever, the expression becomes anxious when any one approaches the bed. The skin is flushed, hot (100°·2), and moist, the perspiration having an acid reaction, and the characteristic odour met with in rheumatic fever.

Locomotory System.—The right shoulder is painful and slightly swollen on its posterior aspect. The left shoulder, elbow, wrist, and fingers are swollen, and very painful and tender. The right hip, knee, ankle, and dorsum of the foot, and the left hip are all similarly affected, and there is some pain in the dorsal and lumbar regions of the back.

Circulatory System.—The precordium is prominent, the area of the heart's dulness on deep percussion is enlarged slightly, the apex beat is very feeble, and faint systolic aortic, and presystolic and systolic mitral murmurs can be detected. The pulse, however, is regular and of fair strength, and its rate is 84 in the minute.

Respiratory and Digestive Systems.—The respiratory and digestive systems are normal, except that the bowels are now constipated.

Genito-urinary System.—No pain accompanies the act of micturition, and 20 ounces of urine are voided in the twenty-four hours, in which a considerable mucus-like deposit occurs. The urine also contains a little albumen, and on microscopic examination one or two hyaline casts containing a few degenerated epithelium cells were seen. There is a white discharge from the vulva, the hymen is ruptured, and symptoms of inflammation of the cervix are present. It was ascertained that the patient had suffered twelve months ago from symptoms which closely corresponded with those of gonorrhœa; and from information obtained from her friends as to her mode of life, and to a recent illness, it was rendered in the highest degree probable that she was now suffering from a blennorrhagia of venereal origin.

Treatment and Progress.—I nevertheless determined to treat her, in the first instance, with salicylate of soda, and she received

from the 11th to the 15th of July 20 grain doses every two hours. Within thirty-six hours, the moderate pyrexia that existed was reduced, and soon afterwards, the pain had disappeared from the joints, leaving only some stiffness and slight swelling. For this reason, and because feebleness of the pulse, headache, tinnitus, and great nervous irritability and excitement were present, the salicylate of soda was on the 15th of July given only every four hours. On the 16th, severe pain and swelling returned to the joints of the left arm, to the right hip, and to the left foot, knee, and hip, and remained in these joints for about ten days. By the 27th of July, the patient was entirely free from pain, and the quantity of salicylate of soda was further reduced by administering the 20 grain dose only three times a day. On the 30th, the pains returned to the joints of the left upper and lower extremities; but the symptoms of salicylism, which were markedly present, the nervous and excited condition of the patient, the existence of well-marked cardiac lesions, and the failure of salicylate of soda to arrest the progress of the disease, after as free an administration of it as could conveniently be adopted, led me, on the 6th of August, to abandon its further administration. Under treatment with iodide of potassium, guaiac, sulphate of quinia, and with local applications to the vagina, the case pursued a protracted course, and the patient was not able to leave the hospital until the 28th of October. Although she had not received any preparation of iron, an examination of the blood on the 20th of October showed that it contained 84 per cent. of hæmoglobin and 5,700,000 red corpuscles.

Case V.—Donald M'G., æt. 38, a wood-turner, was sent into Ward XXVI. of the Royal Infirmary on the 9th of January 1882, by Dr Joseph Bell, to whom he had applied on that day to be treated for gonorrhœa. He also complains of pain in both knees, in the right elbow, left ankle, and, to a slight degree, in the left shoulder.

Twelve years ago the patient had suffered from gonorrhœa, which lasted for fifteen months, but had not been accompanied with much pain on micturition, nor with pains in the joints. Fourteen weeks ago he again contracted gonorrhœa, which he says has been much more severe than the former attack, and has been accompanied with great pain on micturition. He consulted an "herbalist," by whom he was treated without benefit for six weeks, and during the next eight weeks the disease was left untreated. Twelve weeks ago, that is, a fortnight after this gonorrhœa began, and while it was unchanged in its severity or in the character and quantity of the discharge, a pain with swelling suddenly occurred at the inner side of the right knee, and nine days subsequently in the left knee and ankle; and then, three weeks after the beginning of the first pain, in the right elbow and left shoulder, remaining persistently in each of the joints, which were thus successively attacked. He was unable to leave his bed, he perspired freely, and

was warm though not very hot. Patient has never previously suffered from rheumatism, nor can any hereditary disposition to this disease be discovered. He has often been in straitened circumstances, and has indulged rather freely in alcoholic beverages.

Condition on 12th June.—Patient is a fairly well-built man, but is at present considerably emaciated. He lies on his back in a constrained posture, and his expression is anxious. The skin is warm (99°·6), and bathed in a profuse perspiration of acid reaction and pungent odour.

Locomotory System.—The right elbow is slightly swollen, and is painful when moved or touched; both knees, and the left ankle below the internal malleolus, are considerably swollen, hot, painful, and tender; and the left shoulder is painful.

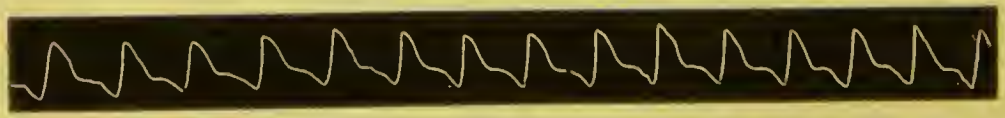
Circulatory System.—The radial artery is somewhat thickened, and the pulse is of good strength, and 118 in the minute. The area of cardiac dulness is normal, and no murmurs can be detected.

Respiratory, Nervous, and Digestive Systems.—The respiratory and nervous systems are normal. Appetite is good, the tongue is dry, much thirst exists, and the bowels are constipated.

Genito-urinary System.—Micturition is frequent, and is accompanied with pain of a hot and scalding nature; and only a small quantity of urine is voided at each time. The urine is alkaline, of a specific gravity of 1020, and contains phosphates, pus-cells, and a trace of albumen. A slight discharge of an opalescent, adhesive fluid is observed proceeding from the orifice of the urethra. The glands in both groins are distinctly enlarged.

Treatment and Progress.—On the 10th, 11th, and 12th of January the patient received 20 grains of salicylate of soda every three hours, and from the 13th to the 24th of January the same dose every two hours, and at the same time the urethritis was treated with injections of weak solutions of tannic acid. The only inconveniences produced by the salicylate of soda were deafness and buzzing sounds, which appeared on the 17th of January. The characters of the pulse were almost unchanged, as may be seen by comparing the pulse tracing of the 10th of January with that of the 24th.

Before the administration of salicylate of soda, 10th January 1882. Pulse, 124 per min.; respirations, 21 per min.



During salicylate of soda, fifteenth day of administration, 24th January 1882. Pulse, 100 per min.; respirations, 24 per min.

The free administration of salicylate of soda for fourteen days

absolutely failed in producing any improvement in the condition of the joints. The average temperature, which, however, was only slightly high, was not reduced; the pulse-rate remained quickened; and a systolic mitral murmur developed itself towards the latter part of the period of administration. The urethritis, however, improved greatly in this period, so that on the 16th of January there was very little discharge, and on the 23rd it had ceased altogether; but a burning sensation remained during micturition. From the 26th of January until his dismissal from hospital on the 2nd of March, the patient was treated with iodide of potassium and colchicum, and with blisters, and applications of the interrupted induced current to the affected joints. On the day of his discharge, pain and swelling had left all the joints except the left knee, where some pain on movement and pressure, and some stiffness, were still present. During the time he was under observation, the arthritic disease restricted itself to the joints that had already been affected before his admission into the Infirmary. Although several changes occurred in the severity of the joint symptoms and of the urethral inflammation, the one did not appear to coincide with the other.

Case VI.—John S., aged 25 years, a gilder, was admitted into Ward XXVI. of the Royal Infirmary, on the 6th of June 1884, suffering from pains in many of his joints, of about five weeks' duration. There is no history of any previous rheumatic affection, nor of hereditary predisposition to this disease.

History.—Twelve years ago he contracted a venereal urethritis, which was recovered from without any rheumatic or arthritic complication. About six weeks ago he again contracted this disease, and a week afterwards pain occurred in the left ankle, then in the left knee, and subsequently the whole of the left leg became extremely painful and tender. Under treatment, the urethritis diminished in severity, the discharge becoming scanty and watery; but as the right knee and several other joints had in the meantime become affected, he applied for admission into the Royal Infirmary.

State on Admission.—On admission, it was found that both ankles, both knees, and the right shoulder and elbow are painful, tender, and slightly swollen. The patient lies in bed with the knees semi-flexed, and both legs resting on their outer side. The temperature is only slightly elevated (100°·5), but the pulse is rapid (95 per minute) and feeble; slight systolic and presystolic murmurs are heard in the mitral area. The bowels are constipated; a somewhat adhesive, slightly opalescent, and scanty discharge is present at the orifice of the urethra; and the urine deposits phosphates copiously, but does not contain albumen.

Treatment and Progress.—From the 9th to the 17th of June, salicylate of soda was administered in 20 grain doses four times a

day. It altogether failed in producing any amelioration in the symptoms, excepting that the average temperature, which was only slightly above the normal, was reduced a few tenths of a degree. The urethritis was greatly improved in a short time, and it by-and-by disappeared under local applications. The persisting joint affection, however, prevented the patient from leaving the Infirmary until the 24th of July.

Several other cases of a subacute and chronic type have recently been under my care, but they have not been described in this paper, as salicyl-compounds were not used in their treatment.

The cases that have been described show, among other points, that salicyl-compounds may be administered in large doses, and for long periods of time, without causing any injury. Inconvenient effects were, no doubt, observed in some of the cases, and it was even necessary to suspend further administration because of them. A considerable experience has now convinced me, however, that salicyl-compounds are fairly well tolerated unless their elimination be interfered with.[1] This interference is most frequently produced by disease of the kidneys, and wherever albuminuria is present, extreme salicylism, including in the case of nervous females much irritability and excitement, may be anticipated if a liberal administration of these compounds be adopted. (See Cases II. and IV.)

The cases further show that salicyl-compounds are therapeutically inefficient in rheumatism, whether acute or sub-acute, when it is associated with a discharge from the genito-urinary mucous surface. Such an association constitutes the disease usually designated gonorrhœal or blennorrhagic rheumatism, whose varieties and phenomena do not appear to have received in this country so much attention as elsewhere.[2] To some extent this neglect may be explained by the comparative rarity of the disease. In 1912 cases of gonorrhœa, for example, Fournier[3] met with only thirty-one complicated with rheumatism. To a greater extent it may possibly be explained by a general restriction of attention to the chronic forms, in which only one or a few joints are affected, and in which the conditions are devoid of much interest.

[1] See on this subject, J. Deseille, *loc. cit.*, p. 79; Blanchier, *loc. cit.*, p. 145; and Cadet, *La Thérapeutique Contemporaire*, 28th Sept. 1881, p. 614.

[2] As contrasted with the numerous theses, the prolonged discussions in the Société Médicale des Hôpitaux (1866–67), and the elaborate papers in medical journals and cyclopædias, which show the great attention that has been given to this subject in France, it is chiefly noticed in this country by brief descriptions in a few pages of general works on surgery and on venereal disease, and it has been treated with a similar neglect in Germany, where, according to Voelker, Lewin, and Talamon (1878), no monograph nor other important contribution to the literature of the subject has been published.

[3] Fournier, *Nouveau Dictionnaire de Médecine et de Chirurgie*, vol. v., 1866.

The disease, however, presents many varieties and forms. It may affect the muscles,[1] the joints, the tendons,[2] the nerves,[3] or the eye,[4] or it may implicate several of these structures. Where the joints chiefly are affected, it may limit itself to the large joints, or may involve both large and small. It may, further, be attended with no rise of temperature, or with a slight or a great rise; constituting chronic, sub-acute, or acute varieties, and in this respect reproducing the forms of ordinary rheumatism.

Its resemblances to uncomplicated rheumatism are also exhibited in other respects. In its polyarthritic variety, it generally, if not always, involves one joint after another; the affected joints become painful, and enlargement, due to effusion into the synovial cavities and into the structures surrounding the joint, redness, tenderness on pressure, and implication of tendons may occur. Sweatings may be profuse, the heart and pleura may become involved, and relapses may mark the progress of a case.

So closely, indeed, may the chief distinguishing characters of ordinary rheumatism be simulated that Ricord,[5] Peter,[6] and Thiry of Brussels[7] have expressed the opinion that blennorrhagic rheumatism has no peculiarity excepting the existence of blennorrhagia, while Talamon,[8] Senator,[9] and others have maintained that in acute cases, with implication of many joints, the blennorrhagia was merely a coincidence in the course of an acute polyarthritic rheumatism.

By the greatest number of observers, however, a special group of symptoms has been associated with gonorrheal rheumatism, and a special influence has been ascribed to the related gonorrhœa, by which a distinct form of disease, gonorrhœal or blennorrhagic rheumatism, is produced. This disease is believed to be distinguished from ordinary rheumatism by the absence, slight degree, or short duration of pyrexia; by the non-appearance of a concentrated urine; by freedom from profuse sweating; by the infrequency with which the heart and the larger serous membranes are

[1] Fournier, *loc. cit.*, p. 229; Talamon, *Revue Mensuelle de Médecine et de Chirurgie*, vol. ii., 1878, pp. 137, 138; Besnier, *Dictionnaire Encyclopédique des Sciences Médicales*, 3me série, vol. iv., 1876, p. 805.

[2] Fournier, *loc. cit.*, p. 229.

[3] Fournier, *loc. cit.*, p. 229; Peter, *Archives Générales de Médecine*, 1867, vol. i. p. 360; Talamon, *loc. cit.*, p. 139; Besnier, *loc. cit.*, p. 805.

[4] Guéneau de Mussy, *Gazette Hebdomadaire de Médecine et de Chirurgie*, tome iii., 1866, p. 780; Bumstead and Taylor, *The Pathology and Treatment of Venereal Diseases*, 4th edition, 1879, p. 235; Tixier, *Considérations sur les accidents à forme rheumatismale de la Blennorrhagie*, 1866, p. 41.

[5] Ricord, *Gazette des Hôpitaux*, 1848, p. 396; *Archives Générales de Médecine*, 1881, vol. i. p. 543.

[6] Peter, *Archives Générales de Médecine*, 1867, vol. i. p. 360.

[7] Thiry, quoted by Ch. Talamon, *Révue Mensuelle de Médecine et de Chirurgie*, ii., 1878, p. 60.

[8] Talamon, *loc. cit.*, pp. 62, 68, 145.

[9] Senator, "Gonorrhœal Arthritis," Ziemssen's *Cyclopædia of the Practice of Medicine*, vol. xvi. p. 73.

implicated; by its rarity in females; by its mono-arthritic character or restriction to only a few joints, and preference for one knee[1] (left); by the little tendency exhibited by the arthritic manifestations to suddenly disappear or to shift from one joint to another; by the persistency of the joint affections; by certain distinguishing characters of the liquid effused into the joint structures; by freedom from hereditary predisposition; and by the composition of the blood being different from that observed in ordinary rheumatism.

In regard to most of these characters, however, we find that different opinions are held by the greater number of those who have given special attention to the disease. Until a few years ago, the classic descriptions recognised only an apyretic form;[2] since then it has been stated to be accompanied, sometimes, with a slight elevation of temperature, of short duration;[3] while a marked elevation, indistinguishable from that of acute rheumatic polyarthritis, has also been met with.[4] It is generally maintained that the urine does not possess the characters of scantiness and concentration met with in acute rheumatism.[5] This is no doubt owing to the descriptions having been founded on the chronic and sub-acute cases to which attention has mainly been restricted. Even in ordinary rheumatism, the state of the urine is largely dependent on the degree of febrile disturbance, and on the quantity of secretion from the skin. While no remarkable change is observed in sub-acute cases, in acute cases the urine has been observed to be scanty and concentrated. This difference in the degree of febrile disturbance also accounts for the contradictory statements that are met with in regard to the secretion of sweat. The observers who recognise only a sub-acute variety of the disease consider the absence of profuse sweating to be a characterizing feature of the disease,[6] whereas those who also recognise an acute variety associate with the cases in this variety the occurrence of profuse sweating.[7] It is usually maintained also that a broad distinction is to be drawn

[1] Besnier, *loc. cit.*, p. 801; Senator, *loc. cit.*, p. 73; Billroth, *Lectures on Surgical Pathology and Therapeutics*, New Sydenham Society, vol. i., 1877, p. 409; Voelker, *loc. cit.*, p. 38; Ricord, *Archives Générales de Médecine*, 1881, vol. i. p. 541.

[2] Besnier, *loc. cit.*, p. 807.

[3] Voelker, *loc. cit.*, p. 89; Besnier, *Dictionnaire Encyclopédique*, vol. iv. p. 799; Talamon, *loc. cit.*, p. 65; Senator, *loc. cit.*, p. 74; Fournier, *Nouveau Dictionnaire de Médecine*, vol. v. p. 239.

[4] Vulpian, *Journal de Pharmacie et de Chemie*, 5me série, vol. i., 1880, p. 435; Sorel, *Révue Mensuelle de Médecine et de Chirurgie*, vol. ii., 1878, p. 581; Meynet, *Lyon Médical*, 19 Janvier 1873; Bourdon, *Gazette des Hôpitaux*, 1868, p. 1; Thierry, *Du Rheumatisme Blenorrhagique*, 1873, pp. 62 and 67.

[5] Talamon, *loc. cit.*, p. 66; Fournier, *loc. cit.*, p. 233.

[6] Talamon, *loc. cit.*, p. 66; Bumstead and Taylor, *loc. cit.*, p. 233; Senator, *loc. cit.*, p. 74; Voelker, *loc. cit.*, p. 60; Bumstead and Taylor, *loc. cit.*, p. 233; Fournier, *loc. cit.*, p. 233.

[7] Meynet, *Lyon Médical*, 19 Janvier 1873; Tixier, *loc. cit.*, p. 91; Thierry, *loc. cit.*, 1873 pp. 56 63, and 67.

between gonorrhœal and simple rheumatism, because complications involving the heart and the larger serous membranes have not frequently been met with in the former disease.[1] Cardiac complications, however, occur most frequently in the acute forms of simple rheumatism, and before the age of puberty,[2] while gonorrhœal rheumatism is most frequently a chronic or sub-acute disease which is produced after the age of puberty. As inflammation of the pleura or of other of the larger serous membranes is not frequently observed in ordinary rheumatism, it is not remarkable that it should be only exceptionally met with in the relatively small number of cases of rheumatism with gonorrhœa that occur. Still, even in this unfavourable circumstance, both cardiac[3] and pleural[4] complications have been met with in gonorrheal rheumatism.

The statements generally made in regard to the relation of the disease to the two sexes are that the female sex enjoys a complete immunity,[5] or is only rarely affected.[6] At the same time, a considerable number of cases have been recorded in which the disease has appeared in women;[7] and in the experience of some physicians the number of these cases, especially when attended with acute phenomena, has been considerable. Thus, in 24 cases observed by Duplay and Brun,[8] 12 were females and 12 were males; in 19 cases observed by Fournier,[9] 7 were females and 12 were males; and in 10 cases observed by Maymou,[10] 7 were females and 3 were males. Many cases in women have no doubt been overlooked on account of the early opinion that the disease is very rare among them still influencing the mind of observers, and no doubt also on

[1] Maymou, *Archives Générales de Médecine*, 1875, vol. ii. p. 564; Drysdale, *On Syphilis*, 1872, p. 16; Voelker, *loc. cit.*, p. 61; Fournier, *loc. cit.*, p. 233; Bumstead and Taylor, *loc. cit.*, p. 233; Senator, *loc. cit.*, p. 74; Talamon, *loc. cit.*, p. 66; Maclagan, *loc. cit.*, p. 6.

[2] Senator, *loc. cit.*, p. 48; Pye-Smith, *loc. cit.*, p. 328; Garrod, *Reynold's System of Medicine*, vol. i., 1870, p. 936; Jacobi, quoted by Hackley, *loc. cit.*, p. 715; Besnier, *loc. cit.*, p. 806.

[3] Peter, *Gazette Hebdomadaire de Médecine et de Chirurgie*, tome iii., 1866, p. 779; Lorain, *Archives Générales de Médecine*, 1867, vol. i. pp. 365 and 366; Morel, quoted by Dr Hackley, Supplement to Ziemssen's *Cyclopædia of the Practice of Medicine*, p. 724; Marty, *ibid.*, p. 725; Desnos, quoted by Dr Weir, *ibid.*, p. 449; Sorel, *loc. cit.*, p. 575; Talamon, *loc. cit.*, pp. 140–143; Pye-Smith, *loc. cit.*, p. 342; Tixier, *loc. cit.*, pp. 58 and 82.

[4] Peter, *loc. cit.*, p. 779; Meynet, *Lyon Médical*, 19 Janvier 1873; Richet, quoted by Talamon, *loc. cit.*, p. 144; Besnier, *loc. cit.*, p. 806.

[5] Brandes, Rollet, Ricord, quoted by Talamon, *loc. cit.*, p. 197; Pye-Smith, *loc. cit.*, pp. 341 and 355.

[6] Fournier, *Nouveau Dictionnaire de Médecine et de Chirurgie*, vol. v. p. 227; Senator, *loc. cit.*, p. 73; Hackley, *loc. cit.*, p. 724; Talamon, *loc. cit.*, p. 196; Bumstead and Taylor, *loc. cit.*, p. 230; Drysdale, *loc. cit.*, p. 16; Voelker, *loc. cit.*, pp. 27 and 29; Bond, *The Lancet*, 1872, vol. i. p. 395.

[7] Besnier, *loc. cit.*, p. 791; Drysdale, *loc. cit.*, p. 16; Vulpian, *Clinique Medicale de l'Hospital de la Charité*, 1879, p. 64; Maymou, *loc. cit.*, pp. 653–672; Thierry, *loc. cit.*, p. 58.

[8] *Archives Générales de Médecine*, 1881, vol. i. p. 545.

[9] *Loc. cit.*

[10] *Archives Générales de Médecine*, 1875, vol. ii. p. 653.

account of the improbability that a discharge, which may have been long existent and unattended with any injury to health, would be associated by the patient with the sudden onset of severe arthritic disorder.

In regard to several of the characters of the joint affection to which much importance has been attached, many of them are of no value as distinctions between simple rheumatism and rheumatism associated with a discharge from the genito-urinary mucous membrane. The belief seems to have existed from the time when gonorrhœal rheumatism was first recognised that it is in a special manner a mono-arthritic disease,[1] and even now this belief finds expression in the writings of physicians and surgeons. It is sometimes stated, indeed, that one of the most characterizing features of gonorrhœal rheumatism is the tendency which it exhibits to affect the knee-joint only, and preferably the left knee.[2] The elaborate data collected by Fournier,[3] Voelker,[4] and others have established the fact, that while gonorrhœal rheumatism is often a mono-arthritic disease, it is more frequently poly-arthritic. The knee-joints are most frequently involved, and then follow the ankles, the shoulders, the hips, the fingers and toes and the wrists and the elbows; while apparently every other joint of the body may be affected. It will be recognised that this is very much the order of frequency met with in simple rheumatic disease.[5]

The statements that the arthritic manifestations have little tendency to suddenly disappear or to shift from one joint to another can be accepted only in a modified manner. In the relatively small, but yet considerable number of cases in which only one joint is affected these characters are necessarily present. In the more frequent polyarthritic variety, however, it is not unusual to find that one joint after another becomes implicated, and that the local manifestations even disappear abruptly from several of the implicated joints. In all cases, however, some persistency in the arthritis is manifested. Where only one joint is affected, the inflammation remains there generally for weeks, and frequently for months; where several joints are affected, the inflammation persists with equal tenacity in one or two of these joints, and long after it has disappeared from the others. This persistency, therefore, in one or more joints, and not the absence of a tendency to pass from one joint to another or to disappear suddenly from an affected joint, is to be regarded as a distinguishing character of the arthritic disease. To it there may, I think, be added a liability, which contrasts strongly with the effects of simple rheumatism, to

[1] Talamon, *loc. cit.*, pp. 64 and 67.

[2] Senator, *loc. cit.*, p. 73; Flint, *A Treatise on the Principles and Practice of Medicine*, 5th edition, 1880, p. 1095.

[3] Fournier, *loc. cit.*, pp. 229, 230.

[4] Voelker, *loc. cit.*, pp. 35–38.

[5] Senator, Ziemssen's *Cyclopædia of the Practice of Medicine*, vol. xvi. p. 38.

chronic changes, resulting in stiffness or in immobility of the joints being produced, and even to suppuration occurring in a joint.

The question of heredity is one also which has probably received an exaggerated importance in the diagnosis of gonorrhœal rheumatism. The statement is very frequently made that this disease is distinguished from ordinary rheumatism by the infrequency with which evidence of hereditary predisposition is to be discovered.[1] Before such a distinction is allowed to have much value it should be recollected that the influence of hereditary transmission is not found to be a very pronounced one when a large collection of cases of ordinary rheumatism is examined,[2] and that it is decidedly apparent only in cases that occur at an earlier age[3] than that in which gonorrhœal rheumatism occurs. In cases of ordinary rheumatism, between the ages of 20 and 40, the period of life when gonorrhœal rheumatism is met with, evidence of hereditary predisposition is only occasionally obtained, nor is this evidence absent in the relatively small number of cases of gonorrhœal rheumatism that have been published.[4]

A predisposition conferred by a previous attack of the disease or of ordinary rheumatism has, however, frequently been observed in gonorrhœal rheumatism,[5] and it is a well-known occurrence in ordinary rheumatism in the earlier years of adult life, which are the years in which gonorrhœal rheumatism attains its maximum frequency.

Distinctions have been drawn between gonorrhœal and ordinary rheumatism on account of certain differences in the characters of the fluid effused into the joint, such as the absence of mucin in the former disease;[6] and on account of differences in the composition of the blood, consisting of an excess of the fibrine and a diminution of the hæmocytes in the latter disease.[7] The observations on which these

[1] Fournier, *loc. cit.*, p. 239, and *Gazette Hebdomadaire*, 14th Dec. 1866, p. 793.

[2] Jaccoud, *Traité de Pathologie Interne*, 7me edition, tome iii. p. 255; Pye-Smith, *loc. cit.*, p. 320; Hackley, *loc. cit.*, p. 712.

[3] Senator, *loc. cit.*, p. 48; Jaccoud, *loc. cit.*, pp. 255, 256.

[4] Voelker, *loc. cit.*, pp. 23–27; Guéneau de Mussy, *Archives Générales de Médecine*, 1867, vol. i. p. 361, and *Gazette Hebdomadaire de Médecine et de Chirurgie*, tome iii., 1866, p. 780; Tixier, *loc. cit.*, p. 82.

[5] Hunter, *Treatise on Venereal Disease*, 1786; Voelker, *loc. cit.*, pp. 17, 24, 114; Guéneau de Mussy, *Gazette Hebdomadaire de Médecine et de Chirurgie*, tome iii., 1866, p. 780; Bond, *loc. cit.*, pp. 395 and 396; Sir Astley Cooper, Rollet, Brandes, Diday, quoted by Bumstead and Taylor, *loc. cit.*, p. 228; Peter, *Archives Générales de Médecine*, 1867, vol. i. p. 360; Fournier, *loc. cit.*, p. 227; Lorain, *Archives Générales de Médecine*, 1867, vol. i. p. 363; Billroth, *loc. cit.*, p. 410; Graves, *Clinical Lectures on the Practice of Medicine*, 1864, p. 740; Maymou, *loc. cit.*, p. 663; Duplay and Brun, *loc. cit.*, p. 560; Besnier, *loc. cit.*, p. 793; Thierry, *loc. cit.*, 1873, p. 53; Diday, *Quelques considérations sur la nature du rheumatisme Blenorrhagique*, 1873, p. 17.

[6] Méhu, *Bulletin de l'Académie de Médecine*, 2me série, 1872, p. 636; Laboulbène, quoted by Thierry, *loc. cit.*, p. 33.

[7] Foucart, quoted by Talamon, *loc. cit.*, p. 66; Senator, *loc. cit.*, p. 37; Hackley, *loc. cit.*, p. 313; Fournier, *Archives Générales de Médecine*, 1867, vol. i. p. 363.

asserted differences are based are, however, too few in number to justify in the meantime any application of them in distinguishing between gonorrhœal and ordinary rheumatism.

A consideration of the cases that have come under my own observation, and of the cases and opinions published by a number of writers, leads me to adopt the view that gonorrhœal rheumatism may present itself under several different forms or varieties.

It may be a chronic, a sub-acute, or an acute disease.

As a chronic disease it restricts itself to one joint or to a very limited number of joints, and its course is marked by no pyrexia beyond that which may be induced by exacerbations in the joint inflammation.

As an acute disease it implicates many joints. It is sometimes accompanied with an initial pyrexia of brief duration and only moderate degree, but exhibiting a liability to recurrence when the inflammatory changes in any of the joints become exaggerated. At other times it is accompanied with more severe pyrexia, which generally differs in no important respect from the pyrexia of rheumatic fever, but occasionally exceeds its usual duration in that disease.

In the chronic form, serous effusion generally accompanies the inflammation in one or more of the affected joints; and even when the disease presents itself as an acute and polyarthritic affection, it has a much greater tendency to be accompanied with hydrarthrosis than is observed in ordinary acute rheumatic polyarthritis.

In the chronic form, the joint or joints originally affected return to a normal state only after a long period of time.

In the acute form, the course of the disease is at first essentially the same as that of acute rheumatism or acute rheumatic polyarthritis. It presents generally the same antecedents and the same initial symptoms. These are also followed by successive implications of the joints, presenting the usual manifestations of rheumatic arthritis or arthralgia; by affections of the heart and of the pericardium; and by changes in the circulation, in the respirations, in the secretion of the skin, and in the characters of the urine. The amount of change in the circulation and respiration and in the secretions of the skin and kidneys mainly depends upon the acuteness of the illness, being controlled, as in acute rheumatism, by the degree of pyrexia that exists. As the case proceeds, however, it presents an aspect which is markedly different from that of acute rheumatism. Although the greater number of the joints by-and-by resume their normal state, in one or two of them the inflammation persists. It there runs a tedious course, and while perfect recovery may be established without any further change, it occasonally happens that the recovery is preceded by suppuration in the joint,[1] or more frequently by stiffness, which only slowly passes away.

[1] The occurrence of suppuration has been denied by several writers (Bond, Brodhurst, Rollet), but that it may occur is shown in Case III., and in cases described or referred to by Besnier, Talamon, Brun, Voelker, and others. It is, however, a very rare event.

To these points of distinction between gonorrhœal and ordinary rheumatism there is to be added the fact of a co-existing discharge from the genito-urinary mucous membranes, and the circumstance, of striking prominence in the acute forms of the disease, that the course of gonorrhœal rheumatism cannot be controlled by salicyl-compounds.

Much attention has been given to the relationship subsisting between gonorrhœal rheumatism and the condition of the genito-urinary mucous membrane with which it is associated. It has been found that great variations occur in the characters of the discharge proceeding from this membrane, and in the interval of time that elapses between the first appearance of this discharge and the commencement of the rheumatic symptoms.

When the rheumatic symptoms first make their appearance, the discharge is sometimes a thick, purulent fluid, proceeding from a membrane which exhibits the usual manifestations of active inflammation;[1] but more frequently it is a mere gleety liquid, the product of a membrane presenting evidence of only slight irritation.[2] The discharge may be copious, or so scanty as to elude discovery unless carefully searched for. If at the commencement of the disease it had been the product of an acute inflammation, it usually becomes modified into a gleety discharge, while the rheumatic or articular disease is still in existence; and the latter may continue after all traces of the discharge have disappeared.

The rheumatic or articular symptoms may appear within a few days[3] after the discharge had originated, or not until several weeks[4] or even months[5] afterwards. In a collection of 56 cases by René of Strassburg, 18 occurred in the third week, and 16 in the fourth week of the gonorrhœa, the others occurring in each week from the first to the eighth.[6] Pye-Smith has observed a case in which the rheumatic symptoms did not appear until nine months after the discharge had first made its appearance.[7]

The belief is very generally expressed that the discharge associated with gonorrhœal rheumatism is one that proceeds from the urethra. It is, indeed, asserted by Ricord,[8] Fournier,[9] Besnier,[10] Bumstead and Taylor,[11] Hackley,[12] and Voelker,[13] that urethritis is the only form of inflammation of the genito-urinary mucous mem-

[1] Billroth, *loc. cit.*, p. 410; Rollet, quoted by Talamon, *loc. cit.*, p. 198.
[2] Fournier, *loc. cit.*, p. 228.
[3] Maymou, *loc. cit.*, p. 663; Duplay and Brun, *loc. cit.*, p. 560.
[4] Sorel, *loc. cit.*, p. 574; Duplay and Brun, *loc. cit.*, p. 558.
[5] Duplay and Brun, *loc. cit.*, p. 557.
[6] René, *De l'arthrite Blennorrhagique*, Strassburg, 1865.
[7] Pye-Smith, *loc. cit.*, p. 343.
[8] Ricord, quoted by Voelker, *loc. cit.*, p. 29.
[9] Fournier, *Gazette Hebdomadaire de Médecine et de Chirurgie*, 1866, p. 794.
[10] Besnier, *Dictionnaire Encylopédique*, 3me série, iv. p. 789.
[11] *Loc. cit.*, p. 229.
[12] Hackley, *loc. cit.*, p. 724.
[13] Voelker, *loc. cit.*, p. 141.

brane which is associated with the disease; and the immunity from this disease, which was erroneously attributed to the female sex, was explained by the relative freedom of females from urethral inflammation.[1] It has now, however, been abundantly proved that the inflammation may be situated in the vagina,[2] or even in the uterus, and that females are by no means exempt from gonorrhœal rheumatism. While there can be no doubt that this inflammation is nearly invariably a manifestation of venereal disease, it is rendered probable by such a case as that of Mary S. (Case III.), described in this paper, and by other cases[3] and considerations,[4] that a non-venereal inflammation, a benign leucorrhœa or simple catarrh for example, may exert the same pathogenic influence in this disease as a venereal or gonorrhœal blenorrhagia, and may equally with it constitute an essential condition of so-called gonorrhœal rheumatism.

It would appear, therefore, that in so far as the condition of the genito-urinary mucous membrane is concerned, the only condition that requires to be present is an inflammation attended with discharge at some part of that membrane. This inflammation is usually a venereal urethritis, but its pathogenic influence does not seem to depend on its being either acute or chronic, or of recent or remote origin, nor do any of these circumstances distinctly influence the course of the symptoms which present themselves.

Among the various hypotheses that have been advanced to explain the relationship between gonorrhœal rheumatism and the associated morbid condition of the genito-urinary mucous surface, two are sufficiently supported by the probabilities in their favour to justify some consideration being given to them. The first is, that the articular and other symptoms constituting the rheumatic manifestations are caused by a reflex irritation starting from the inflamed genito-urinary surface; and the other, that these manifestations are the result of the absorption of some toxic product of the inflammation on the genito-urinary surface.

The theory of reflex irritation has been stated in epigrammatic form by Fournier in the sentence,—"Donnez-moi une sonde, et je vous ferai un rheumatisme blennorrhagique."[5] It has, however, to contend with the difficulties that the degree of irritation existing in the genito-urinary mucous membrane is in no way related to the severity of the articular or general symptoms; that new joints become affected while this irritation is subsiding; and that even in the most violent cases of urethral inflammation, gonorrhœal rheumatism is rarely observed. Although irritative changes in the urethra, such as may follow the introduction of a catheter,

[1] Ricord, quoted by Fournier, *Nouveau Dictionnaire de Médecine*, vol. v. p. 227.
[2] Maymou, *loc. cit.*, p. 670.
[3] Voelker, *loc. cit.*, pp. 137–139.
[4] Senator, *loc. cit.*, p. 73.
[5] Fournier *Gazette Hebdomadaire de Médecine et de Chirurgie*, 1867, p. 44.

do occasionally cause articular disturbance, probably by a reflex irritation, this disturbance is usually only slight and of short duration. Should it present a severe form, and be accompanied with pyrexia and other general symptoms, the explanation is not to be found in reflex irritation, but in the absorption from an inflamed surface of some toxic substance. The symptoms in this latter case do not correspond with those of gonorrhœal rheumatism,[1] although they present some analogies to them.

The theory of a toxæmia originating at the genito-urinary mucous membrane has, accordingly, received much support.[2] It seems, indeed, sufficient to explain many of the phenomena in all cases of gonorrhœal rheumatism. It probably affords a complete explanation, also, of the phenomena in many of the cases in which only chronic inflammation occurs in one or a few joints, and is unattended with much general disturbance of health.

A not inconsiderable number of cases is met with, however, such as Cases I., II., III., and IV., described above, and others recorded by various observers, where a theory of toxic infection from an inflamed genito-urinary mucous membrane is of itself inadequate to afford a satisfactory explanation. In these cases, the course of the illness is indistinguishable at its commencement and during a portion of its progress from that of ordinary rheumatism, although generally, but not always, the subsequent progress is strongly suggestive of toxæmic infection. It is to these cases that a peculiar interest is attached, as they seem to indicate that a gonorrhœal rheumatism exists whose phenomena are the result of ordinary rheumatism and of co-existing toxæmia caused by some product of the inflammation of the genito-urinary mucous membrane.

I am, therefore, led to adopt the following conclusions:—

1. That many of the cases which have been considered to be gonorrhœal rheumatism were merely cases of toxæmia, produced by a toxic substance absorbed from an inflamed genito-urinary mucous membrane. The cases I refer to are met with especially among the examples of chronic mono- or oligo-articular inflammation.

2. That in other cases the disease is a rheumatism modified by toxic infection from a venereal or non-venereal inflammation of the genito-urinary mucous membrane. The rheumatic or toxæmic phenomena may in these cases be present in very different degrees of relative prominence, sometimes the rheumatic, and, at other times, the toxæmic phenomena being the more prominent. This, the true form of gonorrhœal rheumatism, presents itself chiefly as an acute or a sub-acute disease.

3. That in no variety of gonorrhœal rheumatism is the progress

[1] Senator, *loc. cit.*, p. 54.

[2] Besnier, *loc. cit.*, p. 795; Talamon, *loc. cit.*, p. 200; Barwell, *On Diseases of the Joints*, p. 101; Féréol, *Archives Générales de Médecine*, 1867, vol. i. p. 368; Hervieux, *Archives Générales de Médecine*, 1867, vol. i. p. 368; Brun, *De l'arthrite aiguë d'origine Blennorrhagique, Thèse*, Paris, 1881, p. 20; Bond, *loc. cit.*, p. 396; Lasègue, quoted by Diday, *loc. cit.*, p. 6.

of the disease materially influenced by the administration of salicyl-compounds; and as the distinction in acute, and even in sub-acute cases between gonorrhœal and ordinary rheumatism is always at the commencement, and sometimes during a great part of their progress, a matter of much difficulty, the failure of the salicyl-compounds in the former disease is a valuable assistance in diagnosis.

The measures I have adopted in the treatment of this disease have been briefly noted in the cases that have been described. They have not led to results that justify the decided recommendation of any course of treatment. At the same time, I am convinced that it is important to cure, as soon as possible, the inflammation of the genito-urinary mucous membrane. In addition, the employment of antipyretics, such as the salicyl-compounds, is beneficial when pyrexia exists; the administration of iodide of potassium, colchicum, guaiac, and alkalies appeared to produce a good effect in all stages of the disease; while blisters, moderate pressure, the interrupted induced electrical current, and passive movements, were apparently of service in the more chronic stages of the joint affection.

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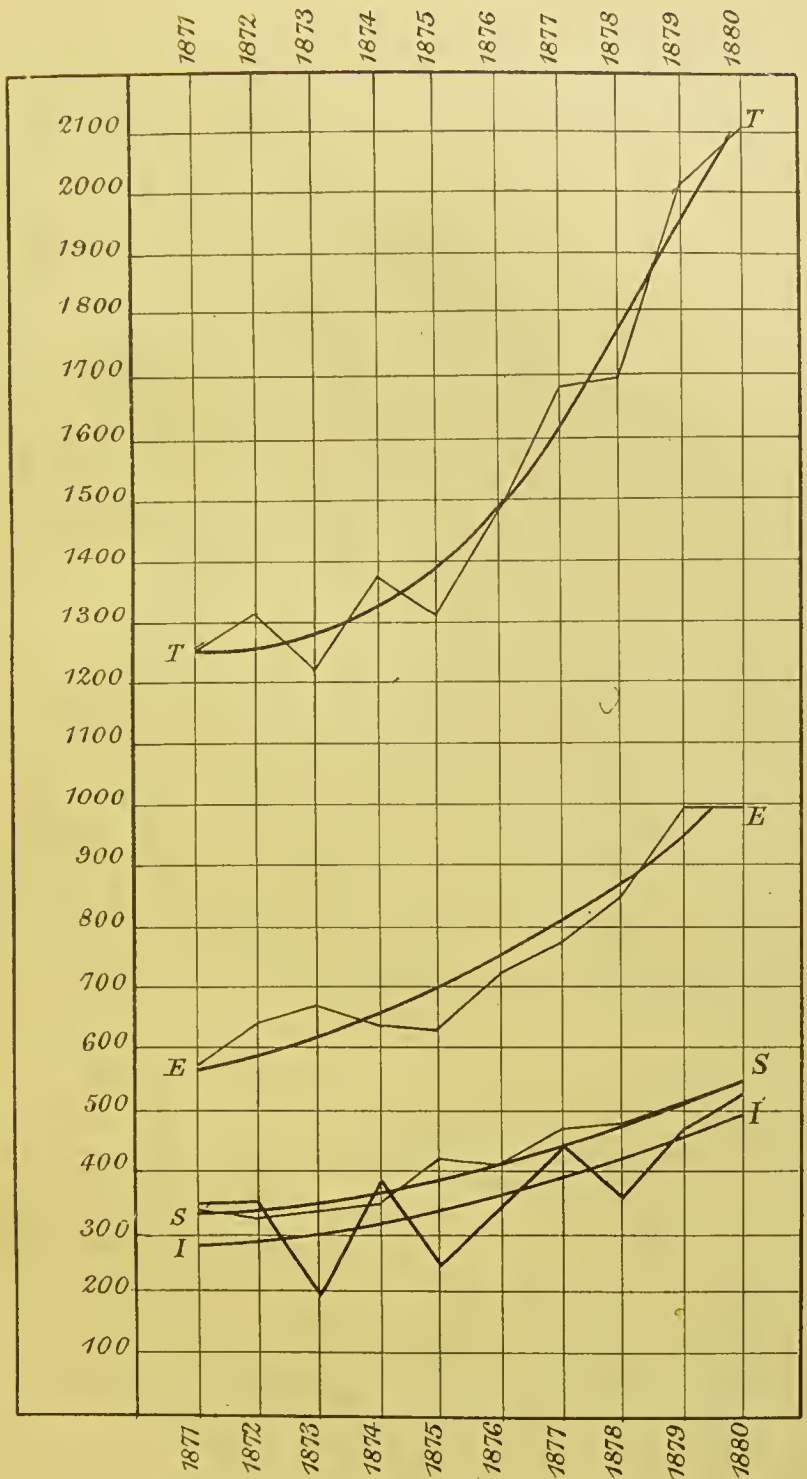
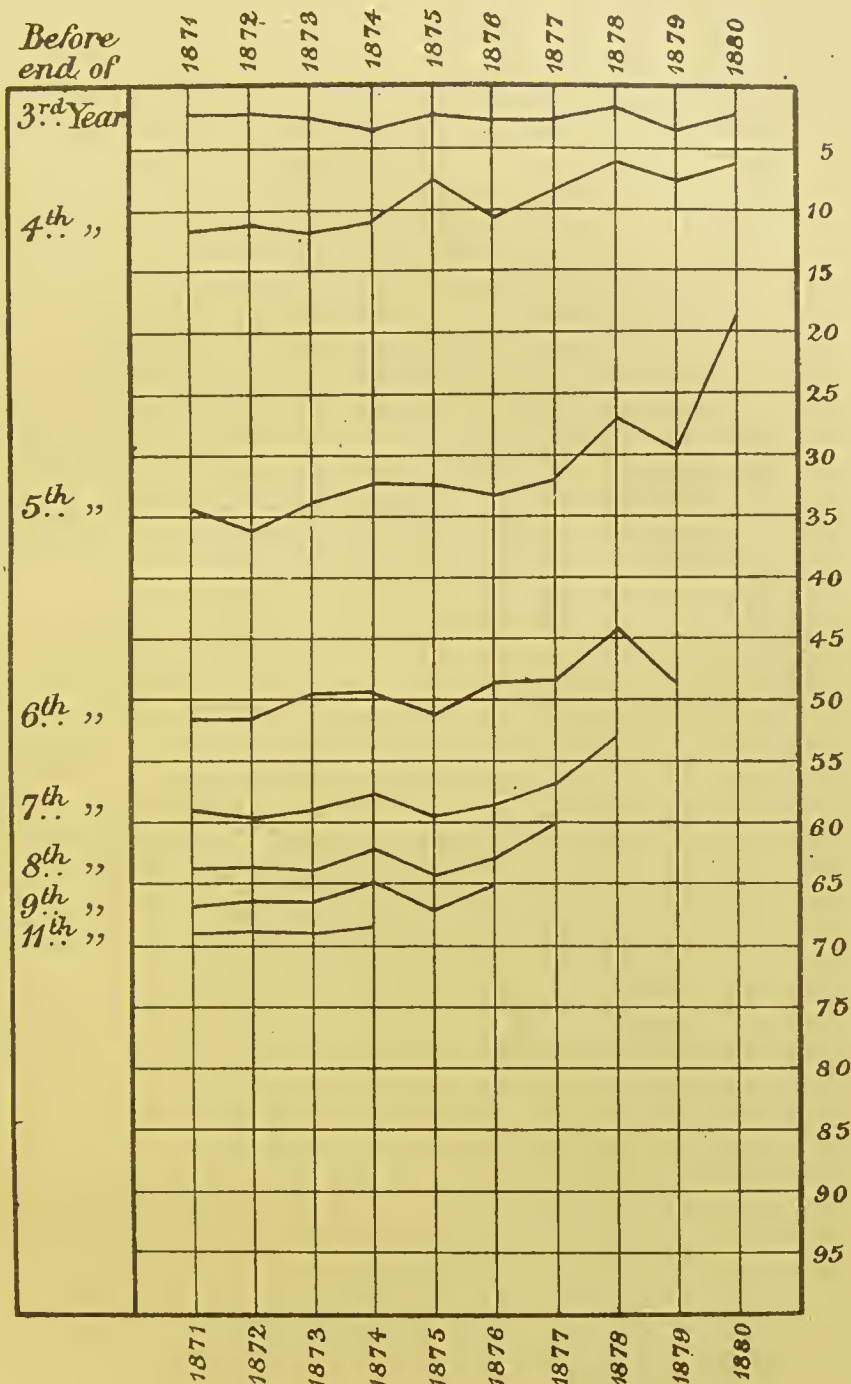
B

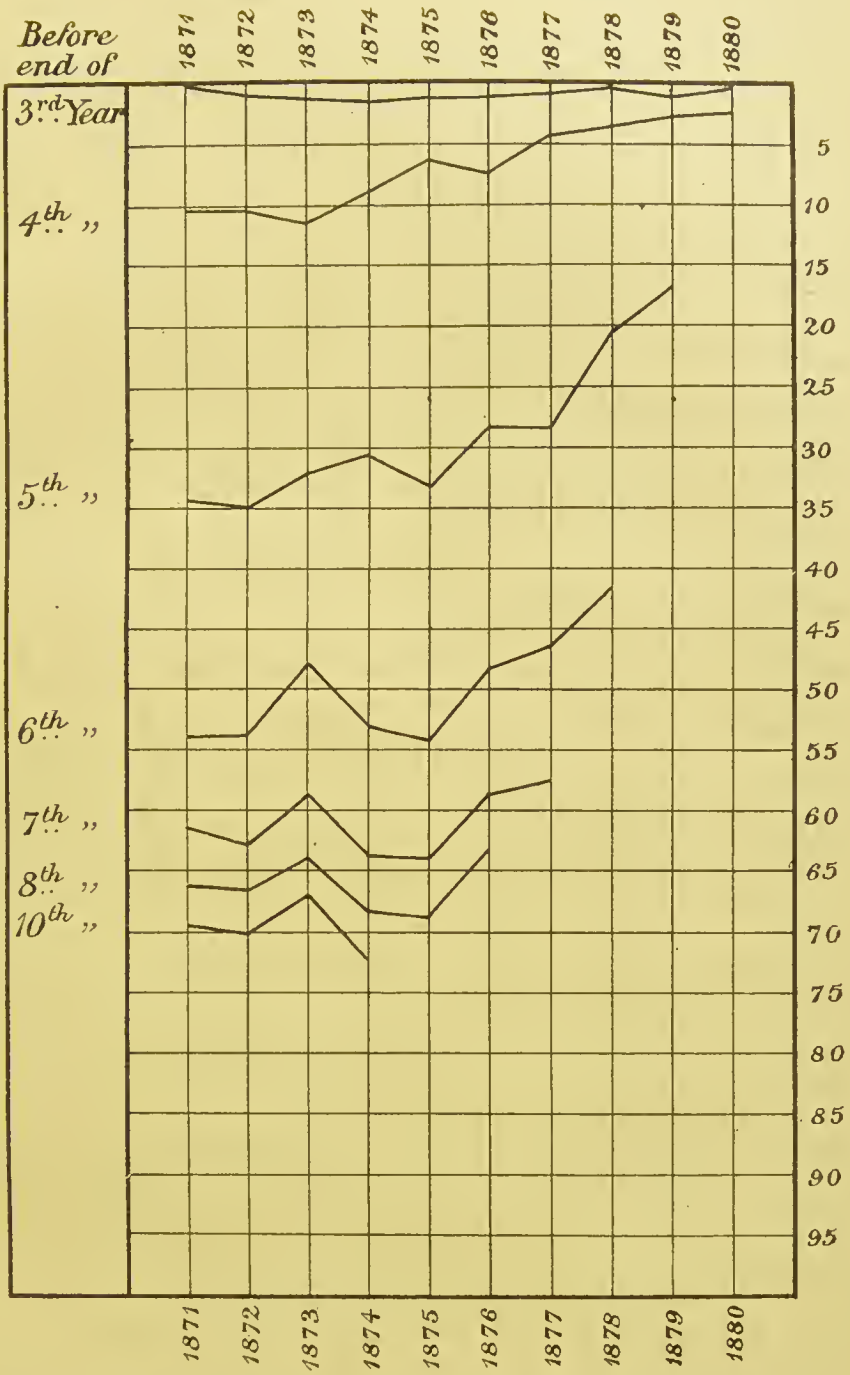


Imaginary Curves of Progress, Striking approximate averages, in Supply of Students, 1871–1880.



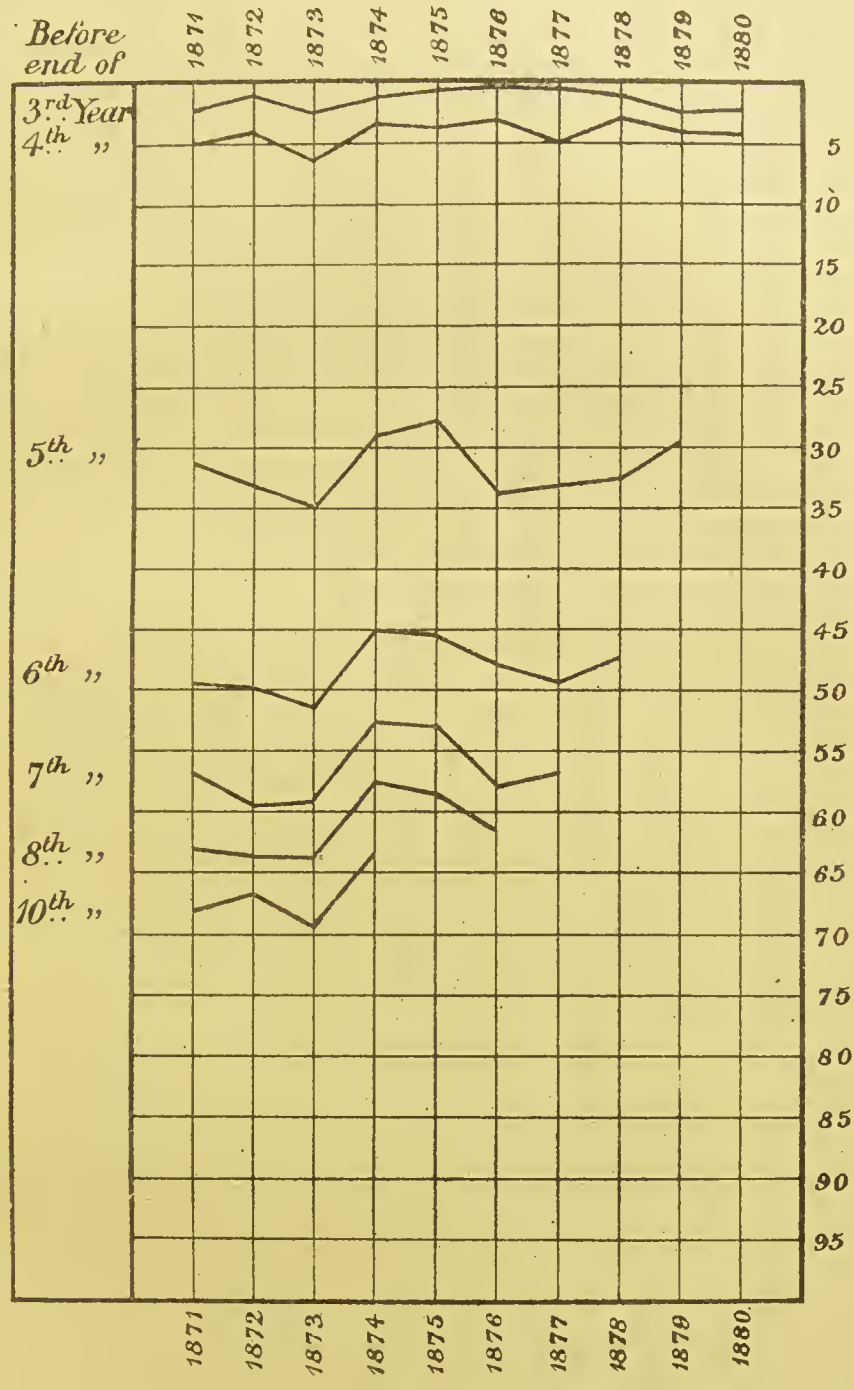
Curves of variation in the numbers qualifying before the expiration of specified periods, in the Students registered as such in the decennium 1871–1880, *in the* UNITED KINGDOM.

D

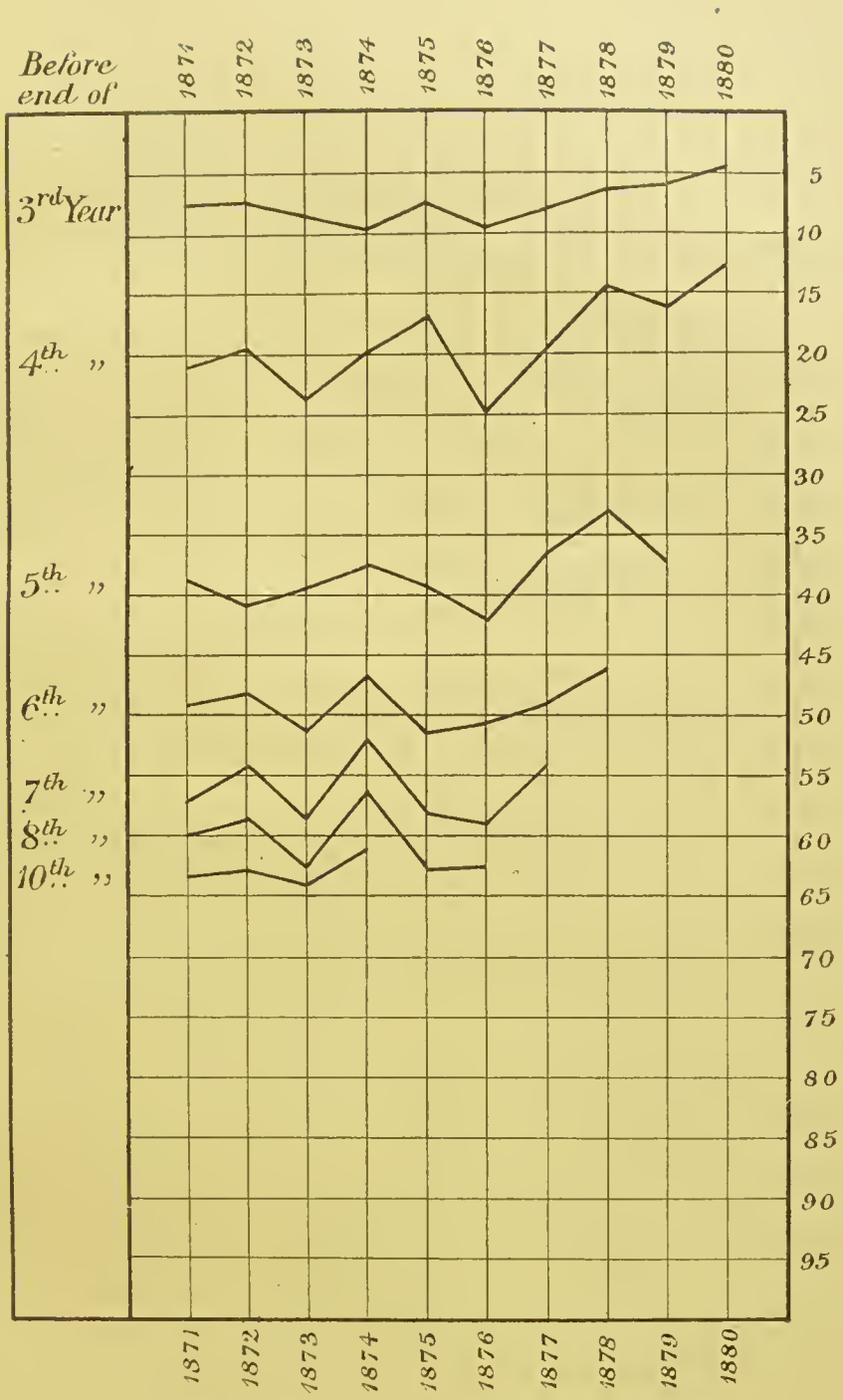


Curves of variation in the numbers qualifying before the expiration of specified periods, in the Students registered as such in the decennium 1871–1880, *in* ENGLAND.

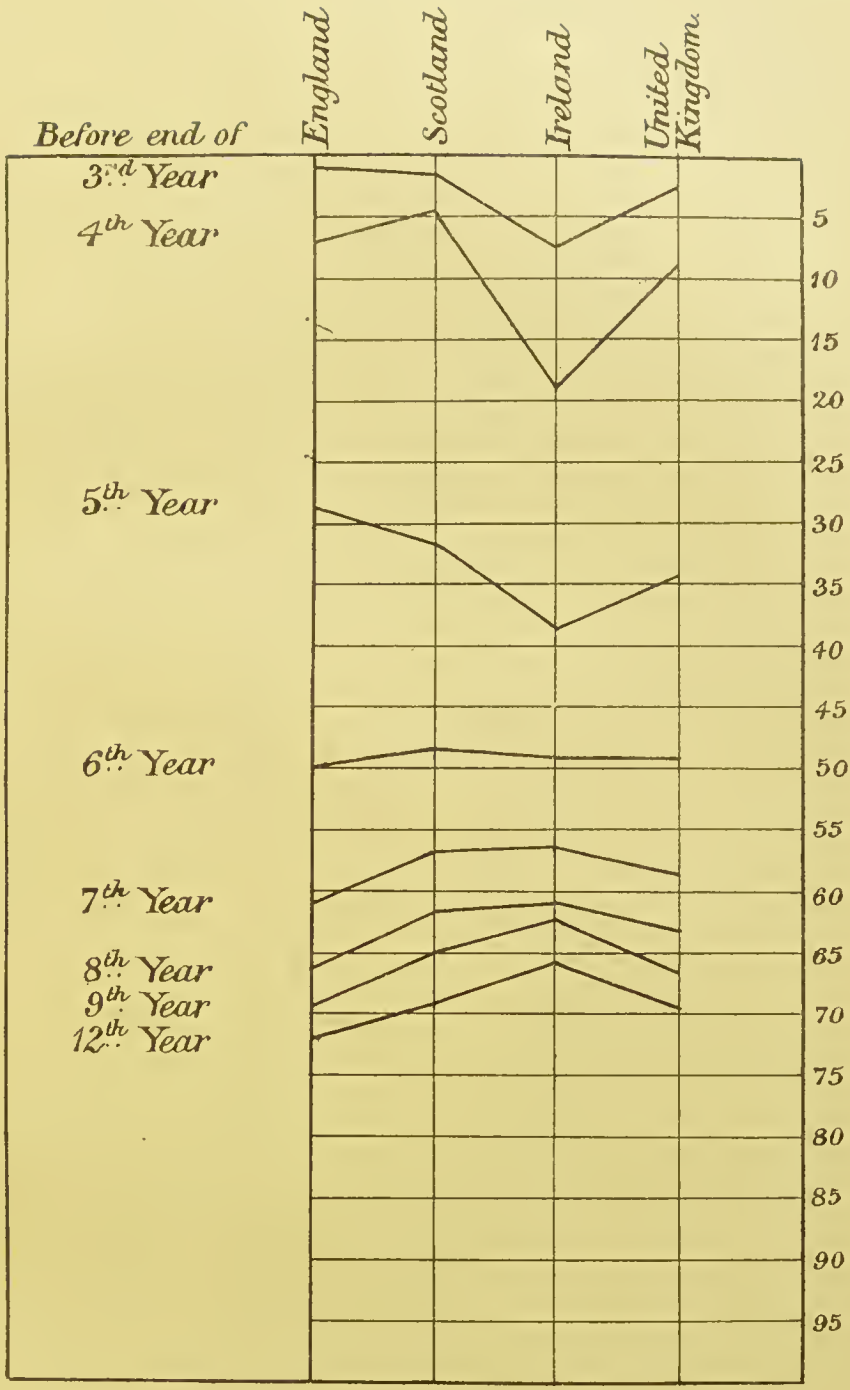
E



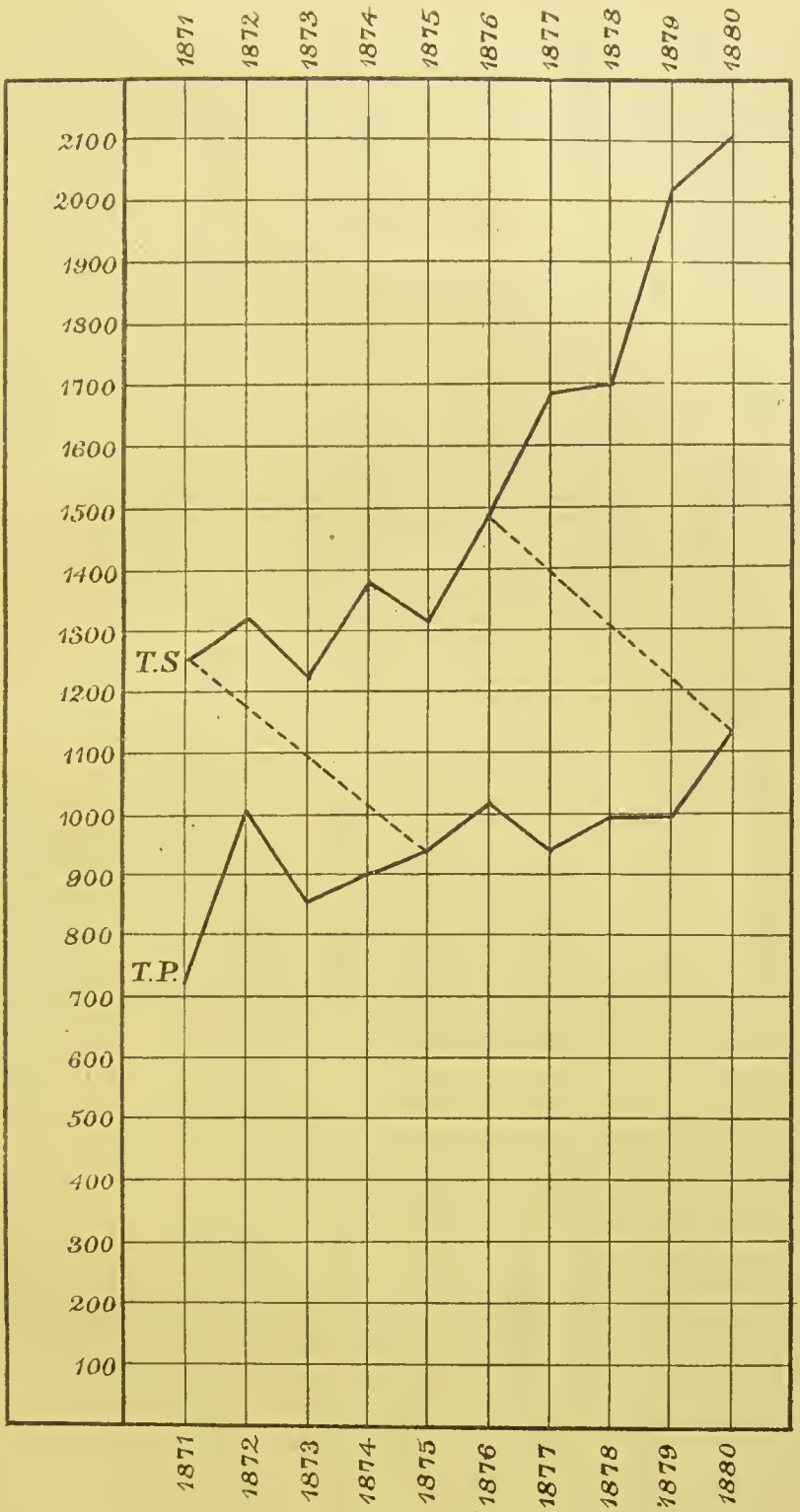
Curves of variation in the numbers qualifying before the expiration of specified periods, in the Students registered as such in the decennium 1871–1880, *in* SCOTLAND.



Curves of variation in the numbers qualifying before the expiration of specified periods, in the Students registered as such in the decennium 1871–1880, *in* IRELAND.



A Diagram illustrative of Table XV and showing the curves of variation in the average speed, in qualifying, of Students registered during the same epochs in the different Divisions of the UNITED KINGDOM.



A Diagram illustrative of Table XVI. and comparing the numbers registered in the Students' Register with the numbers registered in the Medical Register in the several years 1871–1880. *The dotted lines indicate where the two curves seem to come into relationship, and where the correspondence ceases. T. S.—Total Students registered. T. P.—Total Practitioners registered in given years.*